

From the INTERNATIONAL SEARCHING AUTHORITY

**PCT**NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL SEARCH REPORT AND  
THE WRITTEN OPINION OF THE INTERNATIONAL  
SEARCHING AUTHORITY, OR THE DECLARATION

To:

LAW OFFICE OF KURT RAUSCHENBACH  
Attn. Rauschenbach, Kurt  
Post Office Box 387  
Bedford, MA 01730  
ETATS-UNIS D'AMERIQUE

(PCT Rule 44.1)

Date of mailing  
(day/month/year)

20/11/2008

Applicant's or agent's file reference

ZON-015CPPC

**FOR FURTHER ACTION**

See paragraphs 1 and 4 below

International application No.

PCT/US2008/004605

International filing date

(day/month/year)

10/04/2008

Applicant

ZOND, INC.

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

**Filing of amendments and statement under Article 19:**

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

**When?** The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report.**Where?** Directly to the International Bureau of WIPO, 34 chemin des Colombettes  
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70**For more detailed instructions,** see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.
3. ☐ **With regard to the protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:
- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
- ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

**4. Reminders**

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. These comments would also be made available to the public but not before the expiration of 30 months from the priority date.

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

See the Annex to Form PCT/IB/301 and, for details about the applicable time limits, Office by Office, see the *PCT Applicant's Guide*, Volume II, National Chapters and the WIPO Internet site.

Name and mailing address of the International Searching Authority

European Patent Office, P.B. 5818 Patentlaan 2  
NL-2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Joannes Vergoosen

## NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

### INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report and the written opinion of the International Searching Authority, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only (see *PCT Applicant's Guide*, Volume I/A, Annexes B1 and B2).

The attention of the applicant is drawn to the fact that amendments to the claims under Article 19 are not allowed where the International Searching Authority has declared, under Article 17(2), that no international search report would be established (see *PCT Applicant's Guide*, Volume I/A, paragraph 296).

#### What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

#### When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

#### Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

#### How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Section 205(b)).

**The amendments must be made in the language in which the international application is to be published.**

#### What documents must/may accompany the amendments?

##### Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

**The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.**

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference ZON-015CPPC	<b>FOR FURTHER ACTION</b> see Form PCT/ISA/220 as well as, where applicable, item 5 below.	
International application No. PCT/US2008/004605	International filing date (day/month/year) 10/04/2008	(Earliest) Priority Date (day/month/year) 14/04/2007
Applicant  ZOND, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed  
☐ a translation of the international application into \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No. III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant  
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 1  
☒ as suggested by the applicant  
☐ as selected by this Authority, because the applicant failed to suggest a figure  
☐ as selected by this Authority, because this figure better characterizes the invention  
b. ☐ none of the figures is to be published with the abstract

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. H01J37/34

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
H01J C23C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2005/103620 A1 (CHISTYAKOV ROMAN [US]) 19 May 2005 (2005-05-19) figures 1,2a,4 paragraph [0040] paragraph [0137] - paragraph [0141] paragraph [0024] paragraph [0044] claim 39  ----- -/--	1-35

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

5 November 2008

Date of mailing of the international search report

20/11/2008

Name and mailing address of the ISA/

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Hochstrasser, M

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 093 293 A (HAAG WALTER [CH] ET AL) 25 July 2000 (2000-07-25)	1-6, 8, 13-15, 19-21, 23-26, 29
A	figure 1 column 7, line 12 - line 40 column 9, line 58 - column 10, line 3 column 12, line 38 - column 13, line 20	7, 9-12, 16-18, 27, 28, 30-35
A	----- EP 1 146 139 A (APPLIED MATERIALS INC [US]) 17 October 2001 (2001-10-17) figures 1, 6 abstract	1-35
A	----- WO 2007/032858 A (APPLIED MATERIALS INC [US]; YE YAN [US]; WHITE JOHN M [US]; HOSOKAWA A) 22 March 2007 (2007-03-22) figure 2 paragraph [0049] paragraph [0052] paragraph [0053] paragraph [0056] - paragraph [0058]	1-35
A	----- US 6 488 822 B1 (MOSLEHI MEHRDAD M [US]) 3 December 2002 (2002-12-03) abstract figures 1, 5, 6	1-35
A	----- US 2006/066248 A1 (CHISTYAKOV ROMAN [US]) 30 March 2006 (2006-03-30) the whole document	1-35

PC1/032006/004005

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
• ✓ US 2005103620	A1	19-05-2005	EP 1690279 A2 WO 2005052979 A2	16-08-2006 09-06-2005
- ✓ US 6093293	A	25-07-2000	WO 9931290 A1 CN 1282384 A CN 1776006 A CN 1896301 A DE 19881914 D2 EP 1042526 A1 HK 1033344 A1 JP 3794919 B2 JP 2002508447 T JP 2004091927 A TW 420822 B	24-06-1999 31-01-2001 24-05-2006 17-01-2007 04-01-2001 11-10-2000 18-08-2006 12-07-2006 19-03-2002 25-03-2004 01-02-2001
✓ EP 1146139	A	17-10-2001	CN 1329678 A WO 0026430 A1 JP 2000144399 A TW 430865 B US 6506290 B1	02-01-2002 11-05-2000 26-05-2000 21-04-2001 14-01-2003
✕ WO 2007032858	A	22-03-2007	NONE	
- ✓ US 6488822	B1	03-12-2002	NONE	
✕ US 2006066248	A1	30-03-2006	NONE	

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY  
(PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2008/004605

International filing date (day/month/year)  
10.04.2008

Priority date (day/month/year)  
14.04.2007

International Patent Classification (IPC) or both national classification and IPC  
INV. H01J37/34

Applicant  
ZOND, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - P.B. 5818 Patentlaag 2  
NL-2280 HV Rijswijk - Pays Bas  
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl  
Fax: +31 70 340 - 3016

Date of completion of  
this opinion

see form  
PCT/ISA/210

Authorized Officer

Hochstrasser, M

Telephone No. +31 70 340-3523



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**Box No. I Basis of the opinion**

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1. With regard to the **language**, this opinion has been established on the basis of:
  - ☒ the international application in the language in which it was filed
  - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ on paper
    - ☐ in electronic form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in electronic form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

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**Box No. II Priority**

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1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43bis.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:



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**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	<u>1-35</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-35</u>
Industrial applicability (IA)	Yes: Claims	<u>1-35</u>
	No: Claims	

2. Citations and explanations

see separate sheet

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**Box No. VIII Certain observations on the international application**

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The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V.

1 Reference is made to the following document:

D1 : US 2005/103620 A1 (CHISTYAKOV ROMAN [US]) 19 May 2005 (2005-05-19)

**2 INDEPENDENT CLAIMS 1, 24, and 30**

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

A sputtering apparatus (100-Figs.1, 2a) comprising:

- a) a chamber (101-Fig.2a) for containing a feed gas (paragraph [0040]);
- b) an anode (104a-c-Fig.2a) that is positioned inside the chamber;
- c) a cathode (102a-c-Fig.2a) assembly comprising target material (paragraph [0024]) that is positioned adjacent to the anode inside the chamber;
- d) a magnet (134a-c-Fig.2a) positioned adjacent to cathode assembly;
- e) a platen (implicit) that supports a substrate (141-Fig2a) positioned adjacent to the cathode assembly;
- f) a power supply (128-Fig2a) having an output that is electrically connected to the cathode assembly, the power supply generating a plurality of voltage pulse trains comprising at least a first and a second voltage pulse train, the first voltage pulse train generating a first discharge from the feed gas that causes sputtering of a first layer of target material having properties that are determined by at least one of a peak amplitude, a rise time, and a duration of pulses in the first voltage pulse train, the second voltage pulse train generating a second discharge from the feed gas that causes sputtering of a second layer of target material having properties that are determined by at least one of a peak amplitude, a rise time, and a duration of pulses in the second voltage pulse train.

In respect to paragraph f, it is noted that D1 discloses, according to the flowchart (Fig.4, paragraphs [0137]-[0138]), that during processing the power supply generates a first pulse train. Said pulse train creates a first discharge that causes sputtering of a first layer of target material determined by the parameters of the

first pulse train. If required, the parameters of the pulse train are modified and thereby the power supply creates a second pulse train. Said pulse train creates a second discharge that causes sputtering of a second layer of target material determined by the parameters of the second pulse train.

Hence, the subject-matter of claim 1 does not appear to be novel in the sense of Article 33(2) PCT.

- 2.2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 24 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

A method for sputtering (Fig.4; paragraph [0137]), the method comprising:

- a) confining a feed gas in a plasma chamber (paragraph [0041]);
- b) applying a first voltage pulse train (354-Fig.4), to a cathode assembly (102a-c-Fig.2a) comprising target material (paragraph [0024]) thereby generating a plasma from the feed gas that sputters a first layer of target material (paragraph [0137]), a peak amplitude, a rise time, and a duration of pulses in the first voltage pulse train being selected to achieve desired properties (paragraph [0044]) of the first layer of target material; and
- c) applying a second voltage pulse train (364, 372-Fig.4) to a cathode assembly (102a-c-Fig.2a) comprising target material (paragraph [0024]) thereby generating a plasma from the feed gas that sputters a second layer of target material (paragraph [0137]-[0141]), a peak amplitude, a rise time, and a duration of pulses in the first voltage pulse train being selected to achieve desired properties (paragraph [0044]) of the second layer of target material.

Hence, the subject-matter of claim 24 does not appear to be novel in the sense of Article 33(2) PCT.

- 2.3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 30 is not new in the sense of Article 33(2) PCT.

Document D1 discloses (the references in parentheses applying to this document):

A method for generating a plasma (claim 39), the method comprising:

- a) confining a feed gas in a plasma chamber (claim 39);

- b) applying a first voltage pulse train (354-Fig.4, claim 39) to a first isolated cathode segment (claim 39) comprising a first target material (paragraph [0024]) thereby generating a plasma from the feed gas that sputters a layer of the first target material (claim 39), a peak amplitude, a rise time, and a duration of pulses in the first voltage pulse train being selected to achieve desired properties of the first layer of target material (claim 39); and
- c) applying a second voltage pulse train (claim 39) to a second isolated cathode segment (claim 39) comprising a second target material thereby generating a plasma from the feed gas that sputters a layer of the second target material (claim 39), a peak amplitude, a rise time, and a duration of pulses in the first voltage pulse train being selected to achieve desired properties of the first layer of target material (claim 39).

Hence, the subject-matter of claim 30 does not appear to be novel in the sense of Article 33(2) PCT.

### 3 DEPENDENT CLAIMS

- 3.1 Dependent claims 2-9, 13-23, 25-29, and 31-35 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty (Article 33(2) PCT), as these features are already disclosed in document D1.
- 3.2 Dependent claims 10-12 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step (Article 33(3) PCT), the reasons be as follows:

The skilled person would regard it a normal design option to use:

- a platen according to claims 10, and 11, to solve the problem of uniform coating
- a platen according to claim 12, to solve the problem of achieving a certain mechanical, electrical, and/or magnetic property of the deposited film.

**Re Item VIII.**

The application does not meet the requirements of Article 6 PCT, because claims 25 and 31 are not clear. Claims 25, and 31 are referring to steps c) and d) of claims 24, and 30, respectively, but step d) is not present in claims 24 and 30.